AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) ~~A frequency hopping sequence generator~~Apparatus for use in a radio telecommunications system comprising:

a frequency offset hopping sequence generator configured to generate variable frequency offsets for a mobile station ~~which utilizes variable frequency offsets generated~~ during a clocking of a time index, the variable frequency offsets being generated ~~and~~ as a function of the time index whereby magnitude of the variable frequency offsets for the mobile station varies based on the time index;

a frequency hopping generator configured to determine a frequency hopping sequence for use in communication between ~~a~~ the mobile station and a network node.

2. (Original) The apparatus of claim 1, wherein the frequency hopping sequence generator generates the variable frequency offsets on the fly as a function of the time index.

3. (Original) The apparatus of claim 1, wherein the variable frequency offsets are chosen so that the frequency hopping sequence provides intra-cell interference diversity.

4. (Original) The apparatus of claim 1, wherein the frequency hopping sequence generator determines a frequency offset index which is mapped to one of plural possible frequency offsets, the frequency offset index being determined to provide the frequency hopping sequence with both interference diversity and orthogonality.

5. (Original) The apparatus of claim 3, wherein the frequency offset index has a first component and a second component.

6. (Currently Amended) The apparatus of claim 5, wherein the first component is an inter-cell component and the second component is an intra-cell component.

7. (Original) The apparatus of claim 6, wherein the inter-cell component is a pseudo-randomly generated number.

8. (Original) The apparatus of claim 6, wherein the intra-cell component I_2 is determined by

$I_2(FN, FOSEED) = S(1 + (FN + FOSEED) \bmod NFO)$

wherein S is a basic sequence of 0, 2, 4, …K_1, K_2, K_2 - 2, … 3, 1, in which

$$K_1 = 2 \bullet \left\lceil \frac{NFO - 1}{2} \right\rceil$$

$$K_2 = 2 \bullet \left\lceil \frac{NFO}{2} \right\rceil - 1$$

FN is a time index;

NFO is a number of frequency offsets in a set of possible frequency offsets; and

FOSEED is a unique integer assigned to the mobile station at one of call setup and handover.

9. (Original) The apparatus of claim 8, wherein the frequency hopping sequence generator allocates frequency hopping sequences to render adjacent frequency collision rates between two frequency hopping sequences with equal FOHSN independent of a choice of two different FOSEEDs utilized.

10. (Original) The apparatus of claim 6, wherein the frequency hopping sequence generator allocates an intra-cell component sequence to a connection between the mobile station and the network node for repeated cyclical use.

11. (Original) The apparatus of claim 6, wherein the frequency hopping sequence generator cyclically switches between plural orthogonal intra-cell component sequences for a connection between the mobile station and the network node.

12. (Original) The apparatus of claim 11, wherein the intra-cell component I_2 is determined by

I_2(FN, FOSEED) = S(1 + (FN + K)mod NFO), in which

wherein S is a basic sequence of 0, 2, 4, …K_1, K_2, K_2 - 2, … 3, 1, in which

$$K_1 = 2 \bullet \left[\frac{NFO - 1}{2} \right]$$

$$K_2 = 2 \bullet \left[\frac{NFO}{2} \right] - 1$$

K = S(1 + (FOSEED + FN div NFO)mod NFO);

FN is a time index;

NFO is a number of frequency offsets in a set of possible frequency offsets; and

FOSEED is a unique integer assigned to the mobile station at one of call setup and handover.

13. (Original) The apparatus of claim 1, wherein the frequency hopping sequence generator is situated at the network node.

14. (Original) The apparatus of claim 1, wherein the frequency hopping sequence generator is situated at the mobile station.

15. (Currently Amended) ~~A frequency hopping sequence generator~~Apparatus for use in a radio telecommunications system comprising:

a frequency offset hopping sequence generator configured to generate variable frequency offsets for a mobile station ~~which utilizes variable frequency offsets to determine a frequency hopping sequence for use in communication between a mobile station and a network node, the variable frequency offsets being generated (1)~~ as (1) a function of a clocked time index; and ~~(2)~~ as (2) a function of a unique integer assigned to the mobile station whereby magnitude of the variable frequency offsets for the mobile station varies based on the time index;

a frequency hopping generator configured to determine a frequency hopping sequence for use in communication between the mobile station and a network node.

16. (Original) The method of claim 15, wherein the variable frequency offsets are chosen so that the frequency hopping sequence provides intra-cell interference diversity.

17. (Original) The apparatus of claim 15, wherein the variable offset is dependent upon an intra-cell component, and wherein the intra-cell component I_2 is determined by

I_2(FN, FOSEED) = S(1 + (FN + FOSEED)mod NFO)

wherein S is a basic sequence of 0, 2, 4, …K_1, K_2, K_2 - 2, … 3, 1, in which

$$K_1 = 2 \bullet \left[\frac{NFO - 1}{2} \right]$$

$$K_2 = 2 \bullet \left[\frac{NFO}{2} \right] - 1$$

FN is the time index;

NFO is a number of frequency offsets in a set of possible frequency offsets; and

FOSEED is the unique integer assigned to the mobile station at one of call setup and handover.

18. (Original) The apparatus of claim 15, wherein the variable offset is dependent upon an intra-cell component, and wherein the intra-cell component I_2 is determined by

I_2(FN, FOSEED) = S(1 + (FN + K)mod NFO), in which

wherein S is a basic sequence of 0, 2, 4, …K_1, K_2, K_2 - 2, … 3, 1, in which

$$K_1 = 2 \bullet \left[\frac{NFO - 1}{2} \right]$$

$$K_2 = 2 \bullet \left[\frac{NFO}{2} \right] - 1$$

K = S(1 + (FOSEED + FN div NFO)mod NFO);

FN is a time index;

NFO is a number of frequency offsets in a set of possible frequency offsets; and

FOSEED is a unique integer assigned to the mobile station at one of call setup and handover.

19. (Currently Amended) A method of operating a receiver which includes a frequency hopping sequence generator for use in a radio telecommunications system, the method including

generating variable frequency offsets during a clocking of a time index and as a function of the time index whereby magnitude of the variable frequency offsets for a mobile station varies based on the time index;

utilizing the variable frequency offsets to determine a frequency hopping sequence for use in communication between ~~a~~ the mobile station and a network node.

20. (Original) The method of claim 19, further comprising generating the variable frequency offsets on the fly as a function of the time index.

21. (Original) The method of claim 19, further comprising choosing the variable frequency offsets so that the frequency hopping sequence provides intra-cell interference diversity.

22. (Original) The method of claim 19, further comprising determining a frequency offset index and mapping the frequency offset index to one of plural possible frequency offsets, the frequency offset index being determined to provide the frequency hopping sequence with both interference diversity and orthogonality.

23. (Original) The method of claim 22, further comprising determining the frequency offset index from a first component and a second component.

24. (Currently Amended) The method of claim 23, wherein the first component is an inter-cell component and the second component is an intra-cell component.

25. (Original) The method of claim 24, further comprising generating the inter-cell component as a pseudo-randomly generated number.

26. (Original) The method of claim 24, further comprising determining the intra-cell component I_2 as:

$I_2(FN, FOSEED) = S(1 + (FN + FOSEED) \bmod NFO)$

$$K_1 = 2 \bullet \left[\frac{NFO - 1}{2} \right] \qquad K_2 = 2 \bullet \left[\frac{NFO}{2} \right] - 1$$

wherein S is a basic sequence of 0, 2, 4, …K_1, K_2, K_2 - 2, … 3, 1, in which

FN is a time index;

NFO is a number of frequency offsets in a set of possible frequency offsets; and

FOSEED is a unique integer assigned to the mobile station at one of call setup and handover.

27. (Original) The method of claim 26, further comprising allocating the frequency hopping sequences to render adjacent frequency collision rates between two frequency hopping sequences with equal FOHSN independent of a choice of two different FOSEEDs utilized.

28. (Original) The method of claim 23, further comprising allocating an intra-cell component sequence to a connection between the mobile station and the network node for repeated cyclical use.

29. (Original) The method of claim 23, further comprising cyclically switching between plural orthogonal intra-cell component sequences for a connection between the mobile station and the network node.

30. (Original) The method of claim 29, further comprising determining the intra-cell component I_2 as:

$I_2(FN, FOSEED) = S(1 + (FN + K) \bmod NFO)$, in which

wherein S is a basic sequence of 0, 2, 4, …K_1, K_2, K_2 - 2, … 3, 1, in which

$$K_1 = 2 \bullet \left[\frac{NFO - 1}{2} \right]$$

$$K_2 = 2 \bullet \left[\frac{NFO}{2} \right] - 1$$

K = S(1 + (FOSEED + FN div NFO)mod NFO);

FN is a time index;

NFO is a number of frequency offsets in a set of possible frequency offsets; and

FOSEED is a unique integer assigned to the mobile station at one of call setup and handover.

31. (Currently Amended) A method of operating a receiver which includes a frequency hopping sequence generator for use in a radio telecommunications system, the method including

generating variable frequency offsets as a function of a clocking time index and as a function of a unique integer assigned to the mobile station whereby magnitude of the variable frequency offsets for a mobile station varies based on the time index; and

utilizing the variable frequency offsets to determine a frequency hopping sequence for use in communication between ~~a~~ the mobile station and a network node.

32. (Original) The method of claim 31, further comprising generating the variable frequency offsets on the fly as a function of the time index.

33. (Original) The method of claim 31, wherein the variable offset is dependent upon an intra-cell component, and wherein the intra-cell component I_2 is determined by

I_2(FN, FOSEED) = S(1 + (FN + FOSEED)mod NFO)

wherein S is a basic sequence of 0, 2, 4, …K_1, K_2, K_2 - 2, … 3, 1, in which

$$K_1 = 2 \bullet \left[\frac{NFO - 1}{2} \right]$$

$$K_2 = 2 \bullet \left[\frac{NFO}{2} \right] - 1$$

FN is the time index;

NFO is a number of frequency offsets in a set of possible frequency offsets; and

FOSEED is the unique integer assigned to the mobile station at one of call setup and handover.

34. (Original) The method of claim 31, wherein the variable offset is dependent upon an intra-cell component, and wherein the intra-cell component I_2 is determined by

I_2(FN, FOSEED) = S(1 + (FN + K)mod NFO), in which

wherein S is a basic sequence of 0, 2, 4, …K_1, K_2, K_2 - 2, … 3, 1, in which

$$K_1 = 2 \bullet \left[\frac{NFO - 1}{2} \right]$$

$$K_2 = 2 \bullet \left[\frac{NFO}{2} \right] - 1$$

K = S(1 + (FOSEED + FN div NFO)mod NFO);

FN is a time index;

NFO is a number of frequency offsets in a set of possible frequency offsets; and

FOSEED is a unique integer assigned to the mobile station at one of call setup and handover.

35. (Original) A method of operating a radio telecommunications system, the method comprising:

allocating a set of frequency offsets to a cell;

generating, during a clocking of a time index and as a function of the time index, a frequency offset index for a mobile station communicating with a network node of the radio telecommunications system;

using the frequency offset index to determine from the set of frequency offsets a selected frequency offset to use for a time step corresponding to the time index in determining a frequency hopping sequence for communication between the mobile station and the network node whereby magnitude of the frequency offsets for the mobile station varies based on the time index.

36. (Original) The method of claim 35, further comprising generating the variable frequency offsets on the fly as a function of the time index.

37. (Original) The method of claim 35, further comprising mapping the frequency offset index to the selected frequency offset.

38. (Original) The method of claim 35, wherein the step of generating the frequency offset index comprises generating an inter-cell component and an intra-cell component.

39. (Original) The method of claim 38, further comprising generating the intra-cell component to provide orthogonal sequences with a variable difference between two sequences.

40. (Original) The method of claim 38, further comprising generating the inter-cell component to provide collision diversity between frequency hopping sequences that are not orthogonal.

41. (Original) The method of claim 35, wherein the step of generating the frequency offset index I for each time step comprises:
generating an inter-cell component I_1 and an intra-cell component I_2;
determining the frequency offset index I as $I = I_1 + I_2$ modulo a number of frequency offsets utilized.

42. (Original) The method of claim 35, wherein the step of generating the frequency offset index I for each time step comprises:
generating an inter-cell component I_1 and an intra-cell component I_2;
pseudo-randomly generating the inter-cell component I_1.

43. (Original) The method of claim 35, wherein the step of generating the frequency offset index I for each time step comprises:

generating an inter-cell component I_1 and an intra-cell component I_2;

obtaining the intra-cell component I_2 as:

I_2(FN, FOSEED) = S(1 + (FN + FOSEED)mod NFO)

wherein S is a basic sequence of 0, 2, 4, …K_1, K_2, K_2 - 2, … 3, 1, in which

$$K_1 = 2 \bullet \left[\frac{NFO - 1}{2} \right]$$

$$K_2 = 2 \bullet \left[\frac{NFO}{2} \right] - 1$$

FN is a time index;

NFO is a number of frequency offsets in a set of possible frequency offsets; and

FOSEED is a unique integer assigned to the mobile station at one of call setup and handover.

44. (Original) The method of claim 35, wherein the step of generating the frequency offset index I for each time step comprises:

generating an inter-cell component I_1 and an intra-cell component I_2;

obtaining the intra-cell component I_2 as:

I_2(FN, FOSEED) = S(1 + (FN + K)mod NFO), in which

wherein S is a basic sequence of 0, 2, 4, …K_1, K_2, K_2 - 2, … 3, 1, in which

$$K_1 = 2 \bullet \left[\frac{NFO - 1}{2} \right]$$

$$K_2 = 2 \bullet \left[\frac{NFO}{2} \right] - 1$$

K = S(1 + (FOSEED + FN div NFO)mod NFO);

FN is a time index;

NFO is a number of frequency offsets in a set of possible frequency offsets; and

FOSEED is a unique integer assigned to the mobile station at one of call setup and handover.